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Within this analysis an attempt is made to determine the scope and kind of liberal arts offerings in agricultural programs in colleges and universities. Also undertakes an evaluation of requirements in terms of their adequacy for developing self-discipline and broad responsibility in professional agriculture workers. Findings are based on analyses of catalog descriptions of bachelor's degree programs in agriculture in 22 colleges and universities (a 33.8 percent representation of the land-grant colleges and universities offering professional instruction in agriculture).

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The Liberal Arts in Agriculture Curricula

JAMES NEWCOMER

THE EVOLUTIONARY NATURE of collegiate instruction in agriculture is in itself assurance that current curricula will not remain static. In agriculture, no less than in other vocations, responsible educators seek to respond to the needs of the individual student and to the requirements of the nation for its welfare and advancement by improving instruction in the field. Throughout its history the liberal arts appear always to have been a point of reference in the development of agricultural instruction.[1] Thus it is likely that no new developments will come about without careful consideration of the place that the liberal arts should hold in bringing the student of agriculture to his most fruitful development.

The embracing purpose of a professional program in agriculture—as in any other vocational field—may be conceived to be threefold: to educate a student to be an efficient workman, an emotionally balanced and disciplined person, and a responsible citizen. With these goals in mind, and with curricular requirements in colleges of agriculture plainly stated in the college catalogues, it is the purpose of this study to analyze curricula in terms of goals and to determine the status of the liberal arts in agricultural programs.[2]

Within the analysis an attempt is made to determine the scope and kind of liberal arts offerings. Finally, the question is asked: Do these requirements seem adequate to develop in professional agriculture workers of competence, self-discipline, and broad responsibility?

II

The material for this study consists in the catalogue descriptions of bachelor's degree programs in agriculture in 22 colleges and universities. This number constitutes a 33.8 per cent representation of the land-grant colleges and universities offering professional instruction in agriculture. The sample represents every section of the country and

[1] See Wayne Rasmussen, "Liberal Education and Agriculture," Institute of Higher Education, Teachers College, Columbia University, New York, 1958.

[2] This analysis is one part of a study of the undergraduate curricula in eight professions directed by Dr. Earl J. McGrath, Executive Officer of the Institute of Higher Education at Columbia University.

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both independent colleges of agriculture and colleges within the structure of the state universities. The geographical representation is indicated on the chart.

The figures derive from an analysis of standard four-year curricula in agriculture. Eliminated from consideration, though among the offerings of some colleges of agriculture, were these programs: Home Economics, any program supervised co-operatively with a college other than the College of Agriculture (e.g., Agricultural Engineering, Vocational Education), and any program running beyond eight semesters.

The first significant finding in the study was that among the 22 colleges represented here, the number of specialized programs a student might elect varies from two to 46. The course requirements differ, of course, from college to college; in some instances the course requirements differ from program to program within the single college. The necessity of finding a common basis of comparison was met in the following manner.

Fifteen of the 22 colleges offer a program that can carry the title of General Agriculture. In three colleges every program has the title of some specialized field; for these colleges the program in Agronomy was used as being most representative of their general requirements. Each of the four remaining colleges applies standard area distribution and hour requirements to all the individual programs. That system can be understood by looking at the catalogue statement of one college: "Requirements for a major in General Agriculture are: Agricultural Courses 50 credits; Biological and Physical Science Courses 24 credits; Courses other than Agriculture and its supporting courses 25 credits; Mathematics 4 credits; Physical Education and Military Science Courses 8 credits; and Elective Courses 25 credits."

This catalogue statement of required subject area distribution is particularly interesting as it reflects the pattern of analysis used in this study. The process of analysis that is followed is to divide all the individual courses within the bachelor's degree program at each college among four main categories: liberal arts courses, semiprofessional or supporting courses, professional courses, and elective courses. A fifth category consists of courses in physical education and military training.

Those courses purely professional in nature are readily identified:

e.g., Draining and Terracing, Fundamentals of Dairying, Cotton Production. Many courses fall into the liberal arts category without question: e.g., English Composition, a humanities elective, American Government. For the purposes of this study, courses in mathematics and the fine arts have been classified among the liberal arts.

There are, however, those subjects which from one point of view may be called liberal, but from another are seen as having professional aspects: e.g., Introductory Botany, Agriculture in Human Affairs, General Chemistry. Within the framework of the liberal arts these subjects are or may well be liberal; within the framework of a professional curriculum they contribute directly to professional development. For the student of agriculture, courses in biology, chemistry, and physics are prerequisite to courses that are strictly agricultural and serve, therefore, to channel the student's interest in the direction of professional competence rather than broadening it through many areas. In this study, therefore, these subjects are considered as semiprofessional or as supplementary to the professional courses.[3]

Even as we attempt to define these three main categories clearly, it is interesting to note how individual courses tend to elude exact classification. It will be granted that Arc and Acetylene Welding cannot be classified among the liberal arts. But is it a professional or a supporting course? And Rural Sociology? And Economics of American Agriculture? In this analysis Welding has been classified as professional, and Rural Sociology and Economics of American Agriculture have been classified as supporting or semiprofessional.

Since our central concern in this study is with the liberal arts component in the agriculture curriculum, the problem of classification becomes more acute in relation to the course which, though placed among the liberal arts, has a kind of vocational competence as its objective. In terms of the official intentions of the colleges as announced in their catalogues, there is a question as to the extent to which such courses as Elementary Statistics, Accounting, and Public

[3] "Agricultural students receive instruction in the sciences of botany, zoology, chemistry, and physics, which are fundamental to agricultural work. . . ." Purdue University Bulletin 1957-1958, Part 4, p. 5. "Each of these major programs is designed to give the students a broad education and a thorough training in those sciences basic to an understanding of technical and practical agriculture." Rutgers College Announcements 1958-1959, p. 112.

Speaking can qualify as liberal arts. Yet for our purposes we have placed them in the liberal arts category. It should be pointed out that this practice results in a larger proportion of liberal arts work than some persons, especially in liberal arts colleges, would be prepared to admit.

III

The method of analysis just described resulted in the table printed below. The names of the colleges are represented by Roman numerals. At the bottom of the table are printed the figures showing the range, the median, and the mean for each category of subject matter.

Two factors should be pointed out as having some influence on the significance of the percentage figures. The first factor attracts immediate attention—the range (or divergence) of hour requirements among the 22 colleges.

Total Number of Hours Required

	Minimum	Mean	Maximum
Semester Hours	124	135.25	151
Quarter Hours	192	206.26	212

The difference between the minimum and maximum semester-hour figure is 27 s.h.—only 4 s.h. short of a full year's course load based on the lower figure of 124 s.h. Obviously, the percentage figures in the subject matter categories must be interpreted with this differential in mind.

A second factor to be weighed is the influence of the physical education and military training figures on the percentage figure in each of the other categories. One college gives no credit for required courses in the two fields; another, which has the maximum semester-hour requirement in this category, requires 12 s.h. or 8.6 per cent of the total curriculum. Even though a student at one college may spend as much time weekly in physical education and military training without credit as a student elsewhere does with credit, the figures do not reflect the fact.

COURSE OFFERINGS IN THE FIELD OF AGRICULTURE

Subject Matter Categories in Hours and Percentages

College	Total Hrs. Required	Liberal Arts Hours	%	Semi-professional Hours	%	Professional Hours	%	Electives Hours	%	P. E., Military Training Hours	%
Northwest											
I	135 s.h.	20	14.8	37	27.4	39	28.9	29	21.5	10	7.4
II	136 s.h.	29	21.3	24	17.7	50	36.8	25	18.3	8	5.9
III	204 q.h.	42	20.6	52	25.5	73	35.8	28	13.7	9	4.4
IV	128 s.h.	28	21.9	30	23.4	40	31.3	26	20.3	4	3.12
West											
V	135 s.h.	22	16.3	29	21.5	41	30.4	35	25.9	8	5.9
VI	210 q.h.	23	11.0	41	19.5	85	40.5	50½	24.0	10½	5.0
Southwest											
VII	143 s.h.	28	19.5	45	31.5	32	22.4	34	23.8	4	2.8
VIII	130 s.h.	20	15.4	23	17.7	80	61.5	3	2.3	4	3.1
IX	144 s.h.	10	6.9	29	20.1	63	43.8	32	22.2	10	6.9
North Central											
X	192 q.h.	37	19.3	24	12.5	58	30.2	61	31.8	12	6.2
XI	124 s.h.	11	8.9	21	16.9	45	36.3	47	37.9	0	
XII	140 s.h.	24	17.1	25	17.8	61	43.6	18	12.9	12	8.6
XIII	128 s.h.	18	14.1	38	29.7	53	41.4	15	11.7	4	3.1
Northeast											
XIV	128 s.h.	30	23.4	29	22.7	27	21.1	34	26.6	8	6.2
XV	124 s.h.	21	16.9	17	13.8	37	29.8	41	33.1	8	6.4
XVI	140 s.h.	29	20.7	28	20.0	44	32.4	29	20.7	10	7.1
XVII	151 s.h.	27	17.9	43	28.5	61	40.4	12	7.9	8	5.3
Southeast											
XVIII	134 s.h.	38	28.4	28	20.9	39	29.1	25	18.7	4	3.0
XIX	211 q.h.	28	13.3	58	27.5	85	40.3	28	13.3	12	5.7
XX	144 s.h.	27	18.8	46	31.9	54	37.5	9	6.2	8	5.6
XXI	212 q.h.	36	17.0	52	24.5	66	31.1	50	23.6	8	3.8
XXII	208 q.h.	20	9.6	40	19.2	86	41.3	50	24.0	12	5.8
HIGH	151 s.h. 212 q.h.		28.4		31.9		61.5		37.9		7.4
LOW	124 s.h. 192 q.h.		6.9		12.5		21.1		2.3		2.8
MEDIAN	135 s.h. 209 q.h.		17.05		21.2		36.05		21.1		5.65
MEAN	135.25 s.h. 206.26 q.h.		16.82		22.28		35.72		20.02		5.06

NOTE: Except for the over-all means and medians, the figures are rounded off to the nearest tenth; e.g., 47.76 is recorded as 47.8.

IV

The mean figures for the five categories reveal clearly the curricular distribution of requirements in agriculture: liberal arts, 16.82 per cent of the total curriculum; supporting or semiprofessional, 22.28 per cent; professional, 35.72 per cent; electives, 20.02 per cent; physical education and military training, 5.06 per cent. It is obvious that the liberal arts constitute a very small proportion of agricultural curricula.

In fact, it is doubtful that in many colleges the proportion of liberal arts is adequate in terms of the stated objectives of the profession.

How effective are these requirements in developing in agricultural workers competence, self-confidence, and responsibility? The objective of preparing agriculture students in the facts and techniques of agricultural employment can be taken for granted. There is general concurrence on the importance of the sciences and their place in the agricultural curriculum. But there remains a third objective, variously stated in the catalogues:

1. "to provide all of its students with a liberal education"
2. "improved cultural background"
3. "a well-balanced education"
4. "a broad educational experience"
5. "a few general courses are included to satisfy cultural and social needs"
6. "a reasonable number of cultural subjects."

The liberal education at the college responsible for the first statement consists of courses in these groups: written and oral English 10 to 12 s.h. and social sciences and humanities 12 s.h. This is about 15 or 16 per cent of the total hour requirement. The college seeking the "improved cultural background" for its students asks them to study English Composition, Algebra and Trigonometry, American Government, and U. S. History for a total of 18 s.h.—about 15 per cent of the total subjects studied. The college offering "a well-balanced education" requires English and speech 8 s.h., social science 10 s.h., and mathematics 4 s.h.—16.3 per cent of the total. Where "a broad educational experience" is offered, the experience in the liberal arts consists of Communication Skills 9 q.h., basic social science 12 q.h., College Algebra 4 q.h., and basic humanities 12 q.h. —19.3 per cent of the total. The college seeking to meet "cultural and social needs" does so by requiring some 17 per cent of the students' courses to be divided among three separate groups besides science and agriculture. The "reasonable number of cultural subjects" consists of about 13 per cent of the total curriculum: English Composition, American History, Public Speaking, Algebra and Trigonometry.

The mathematics requirements have been classified here among the liberal arts. But the science figures (for courses that are not specifically agricultural in content) have been classified as supporting

courses. The word "supporting" indicates the bias of reasonable interpretation—that considerable science is required specifically for the purpose of augmenting the quality and quantity of professional preparation.

The amount of liberal arts required is small. And it must be recognized, as the preceding analysis shows, that the liberal arts courses are largely elementary in scope and the depth and variety of liberal arts experience restricted. Since the mean figure for elective courses is 20.02 per cent, it is apparent that the student could materially increase the depth and variety of his liberal arts experience by using electives for this purpose. At College II "19 credits are required in courses other than agriculture and its supporting courses" in addition to general requirements. In College XI 20 elective credits are required outside the college of agriculture. In College XXII one minor of 10 q.h. in any department of the university other than agriculture is stipulated.

But there is some evidence that more often than not the student is directed toward professional courses. At College III more professional hours are required in the specialized courses than in the course in General Agriculture. At College VIII, though 50 s.h. are required in general education according to the general statement, the sample course outline in the catalogue allows for only 44 s.h. At College X it is intended that the student will build an intensive major from the electives. At College XIV, where the liberal arts account for 23.4 per cent of the curriculum, the catalogue states: ". . . one-quarter of his time to pure science, one-quarter to social and humanistic studies, and about one-half to applied science and technology in agriculture and horticulture." At College XVIII the suggested electives are usually professional or supporting courses.

The facts revealed by the analysis have supplied reliable data from which inferences may be drawn about the adequacy of the amount of liberal arts students take. The answer to question three will be found with less certainty. There is room, however, for what may be considered a justifiable assumption. If professional competence is in direct ratio to professional training, these students should be competent in the field of agriculture. But even as we make this assumption, we face the facts that no profession exists in isolation from the other aspects of society, and that no leader in any profession exercises his leadership without a sympathy with other aspects of community and

national life that derives from knowledge and understanding. Will not the agricultural worker meet nonagricultural demands better by so much as his education, apart from agriculture, has equipped him to meet those demands? As we have seen, many of the colleges of agriculture affirm their intention of equipping their students to become leaders. But the student whose experience in English is limited to elementary composition, in social studies to some state history, an introductory course in government, and perhaps an introduction to psychology, in the fine arts more often than not to nothing—this student has little to draw on from his formal training (outside of the general side effects of his professional courses) to help him become an effective leader.

College XIII, with 14.1 per cent of its curriculum devoted to the liberal arts, states that its first aim "is to develop in students the qualities of an educated person, including capacity for leadership and human understanding and a philosophy for personal, family, and community living." Here are man's noblest purposes put in simple, straightforward terms. Even as instruction in the field of agriculture has developed from its small beginnings a century and a half ago to its comprehensive scope and specialized emphasis today, agricultural leaders at every step in that development have pointed again and again at those ideals. As Edward D. Eddy, Jr., pointed out in 1955, "the combination of vocational education and general or cultural education, not just in the same institution but often in the same course, was a major contribution of the land-grant colleges to education."

The figures revealed here, however, raise the question of the adequacy of the average curriculum in agriculture in this study to meet the goals that the colleges set for themselves in their catalogues. The leadership that the agricultural colleges have shown—and continue to show—in the development of American democracy is an evident and acknowledged fact. There is no doubt that instruction in agricultural courses and in the supporting courses does contribute to the exercise of responsible citizenship by the students, to their capacity for leadership, and to their cultural awareness. But if there is validity in the belief that the ideals of civic responsibility and cultural attainment have a direct relationship to the quality and quantity of the liberal arts experience of the student, many students in agriculture are at something of a disadvantage in those respects compared with

the students in certain other professions and the student in the liberal arts college.

The highest proportion of liberal arts offered among these 22 colleges is 28.4 per cent of the curriculum. The average is 16.82 per cent. Technical training alone, with this small added percentage of liberal arts experience, does take the student some distance along the road toward those goals we have examined. But wisdom, beauty, the challenge to duty; the excitements of the intellectual life; the defiance of ignorance and evil; the worth of sacrifice; the drive of human purpose that embraces all the vocations and makes of each only a segment of the whole—how deeply are students in the curricula studied here inspired toward goals stated in terms like these?

Literature, history, philosophy, religion, the arts: they are largely missing in these curricula. No one would gainsay the value of agricultural study without them. But imagine the value of agricultural study with a large experience in the liberal arts added to it. That objective seems to be the goal of many curriculum planners, as revealed by their own statements in catalogues, but more particularly in the public utterances of many leaders in agricultural education. Some of the institutions studied appear also to have this objective clearly before them, and to have enriched the curriculum in agriculture toward this end. Others are still grappling, it is apparent, with the problem of how to prepare graduates competent in their calling and at the same time broadly educated for the responsibilities of citizenship and the activities of personal life unrelated to their work.

The most encouraging aspect of this study is the evidence that the leaders in the schools of agriculture are aware of the need for a broader education for their students. Other evidence supports the generalization that the present narrowness in some programs of agricultural education will in the near future be eliminated in favor of a broader foundation in the liberal arts disciplines.